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ABSTRACT

Sex differences in the correlations between Rotter's Internal-External (I-E) Control of Reinforcement Scale and the Omnibus Personality Inventory (OPI) are predicted, based on a theoretical expectation of a relationship between I-E and adjustment, and previous research. Both tests were administered to 140 male and 130 female college freshmen. Correlation and stepwise multiple regression analyses indicates significant correlations (p<.05) between I-E and several OPI scales and factors. Sex differences were obtained in absence of sex bias in the OPI. These findings have implications for research using the I-E variable. (Author)

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SEX SIMILARITIES AND DIFFERENCES IN THE RELATIONSHIP BETWEEN LOCUS OF CONTROL AND THE OPI[1]

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Correlations, and sex differences in the correlations, between Rotter's Internal-External (I-E) Control of Reinforcement Scale and the Omnibus Personality Inventory (OPI) were predicted based on a theoretical expectation of a relationship between I-E and adjustment, and previous research. Both tests were administered to 140 male and 130 female college freshmen. Correlation and stepwise multiple regression analyses indicated significant correlations ($p < .05$) between I-E and several OPI scales, and between I-E and several OPI factors. Sex differences were obtained in the variables most predictive of I-E. Factor comparisons indicated an absence of sex bias in the OPI. These findings have implications for research using the I-E variable.

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SEX SIMILARITIES AND DIFFERENCES IN THE RELATIONSHIP BETWEEN LOCUS OF CONTROL AND THE OPI

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During the last few years psychologists and educators have become increasingly interested in locus of control of reinforcement in relation to academic adjustment and achievement. Locus of control is defined within the context of Rotter's (1954) social learning theory as an individual's expectancy regarding the relationship between reinforcement and behavior. An internally oriented individual is one who tends to expect reinforcements to occur as a consequence of his behavior, while an externally oriented individual expects reinforcements to be under the control of fate, chance, or powerful others.

One frequently used measure of this construct with college students and other adults is Rotter's Internal-External (I-E) Control of Reinforcement Scale (Rotter, 1966). Although there is considerable evidence for the empirical validity of this scale (Lefcourt, 1966, 1972; Rotter, 1966), there has been little success in relating it to other personality variables. I-E scores were found to be negligibly correlated with the Marlow-Crowne Social Desirability Scale (Rotter, 1966), but significantly correlated with the Edwards Social Desirability Scale (Cone, 1971). Significant correlations with dominance on the Edwards Personality Preference Scale (DiGiuseppe, 1971), and with the neuroticism

scale of the Eysenck Personality Inventory (Platt, Pomeranz, & Eisenman, 1971) have been reported. However, significant correlations were not obtained with the Keller measure of self-esteem (Platt, Eisenman, & Darbes, 1970), and the Rydell-Rosen Tolerance for Ambiguity Scale (Pawlicki, 1972). A measure of self-actualization (Personal Orientation Inventory) was found to correlate significantly (Warehime & Foulds, 1971), but an attempt to replicate the relationship was not successful (Bass & Stek, 1972). However, there is, according to Rotter (1966), a theoretical basis for expecting a low linear positive correlation between I-E and adjustment. There is also reason to expect a correlation between internality and achievement motivation (Rotter, 1966), and considerable evidence indicates that there is a positive correlation between internality and academic achievement (Lefcourt, 1972).

Another personality instrument which is correlated with academic aptitude and achievement, and has personal adjustment as one of its major underlying dimensions is the Omnibus Personality Inventory (Heist & Yonge, 1968). The OPI with its fourteen scales is of much broader scope than the I-E scale, and the OPI contains no direct or implied measure of a locus of control construct. But, as indicated above, there is considerable overlap in the descriptions of some of the correlates and underlying dimensions of the two scales. Therefore, in the present study, the two instruments were compared, and it was expected that there would be statistically significant correlations between the two.

An additional expectation was that there might be sex differences in the patterns of OPI dimensions that were correlated with I-E. In previous research utilizing I-E, no clear pattern of sex similarities and differences has been described. Differences in the relationship between I-E and achievement have been noted (e.g., Rotter, 1966; Wolk & DuCette, 1973), and there was a sex difference in the relationship of I-E to self-actualization (Warehime & Foulds, 1971). In the attempt to replicate this finding, the directionality of the sex difference remained the same even though the correlations were not significant. Platt, Pomeranz, & Eisenman (1971) reported a correlation between I-E and neuroticism by sex. However, the difference was slight. Johnson (1973) found that male external Ss tended to be less confident in their problem-solving abilities than were internals. A similar finding was not obtained for females. Despite the lack of clear direction offered by previous research, our expectation of finding differences was based on the observations that (1) there are significant differences between males and females on several of the OPI scales in the normative sample, and (2) these differences might contribute to a personality profile for the internally oriented male that is different from that of the internally oriented female.

METHOD

Subjects

The subjects were 140 male and 130 female freshmen at Indiana University. All had CEEB SAT scores $\geq$ 1000, and were tested as part of a comprehensive evaluation of a program

addressed to the integration of learning programs and learning environments. Ss were tested in groups at convenient times during the first part of the fall, 1972, semester. The I-E scale was administered before the OPI in separate sessions. Ss were assured that their responses would be confidential and would be used on a group basis only.

Procedure

Two analyses were conducted. The first used I-E scores with the OPI scale scores, while the second was based on I-E scores and factor scores of the OPI. In the first analysis, males and females were tested in terms of differences in mean scores on all scales. Differences on some scales of the OPI were expected. In order to determine whether any sex bias existed within the OPI measures taken for this study, the data from each sex group were factor analyzed, and the resulting factor structures were compared. A principal-axis analysis using squared multiple-correlations as communalities, and rotated to a varimax solution was used (Veldman, 1967). The resulting factor structures were compared to see if a match could be obtained when the vectors representing the dimensions of one set of data were overlayed on top of the other set (Veldman, 1967). Following this step, product-moment correlations of I-E with OPI scale scores were obtained in order to verify which OPI scales had the greatest relationship to I-E. Finally, a stepwise multiple regression analysis was performed to determine which OPI scales would make a significant contribution to the multiple correlation with I-E for each sex.

A second analysis was performed due to high intercorrelations among several OPI scales. In order to reduce the dimensionality of variables correlated to I-E, factor scores for each of the nine factors comprising the OPI (Heist & Yonge, 1968) were computed for each subject. This was accomplished by factoring the intercorrelation matrices reported by Heist & Yonge (1968) for each sex on the OPI. The same factor analytic method described above was used here, and the resultant loadings were consistent with the loadings reported by Heist & Yonge (1968). Therefore, the factor score weights obtained from this analysis were multiplied times the appropriate z score of each OPI scale for each S. The second step of this analysis was to check for sex bias in the normative sample on the OPI. According to Heist & Yonge (1968), there are no sex differences in the OPI even though separate correlation matrices, based on a normative sample of 3,540 males and 3,743 females, are reported. This was verified by comparing, as in the first analysis, the factor structures which had been obtained from each correlation matrix of the normative groups. The next two steps of this analysis were also parallel with the first analysis. The factor scores were correlated with I-E for each sex, and then entered into stepwise multiple regression analysis. In the final step, as a test of the robustness of the differences between males and females, an attempt was made to predict male I-E scores from the OPI factors which were significant predictors for females by using them in a multiple regression analysis. The same was done with females using the best predictors for the males.

RESULTS

First Analysis

In the first analysis, the mean for females was slightly higher ($p = .05$) than the mean for males on the I-E scale (Table 1) which means that the males were more internal than the females. The internal consistency estimates (Table 1) of the I-E scale, using the alpha coefficient, were consistent with the normative data reported by Rotter (1966). However, the means are considerably higher than the normative groups, and could reflect a trend toward greater externality among college students which was noted by Schneider (1971) over the period of 1966-1970.

Insert Table 1 about here

Comparison of the mean scores of males and females on each of the OPI scales (Table 2) indicated significant differences on six of them, but only one, Masculinity-Feminity (MF), was of major magnitude. These findings were consistent with the normative data (Heist & Yonge, 1968).

Insert Table 2 about here

In comparing the factor structures of the males and females on the OPI, an absolutely perfect match would result in cosines of 1.00 for all matched factors, and cosines of 0.00 for all unmatched factors. Thus, as can be seen from Table 3, an almost perfect match between the factor structures of the two sexes

was obtained. There was no reason to suspect a sex bias in the OPI scores obtained from the present sample.

Insert Table 3 about here

There were significant zero order correlations between I-E scores and nine of the OPI scales for each sex (Table 4). The correlated scales were the same for each sex with one exception. Estheticism (Es) and I-E were significantly correlated only for males, while Autonomy (Au) and I-E were significantly correlated only for females. Of the significant correlations, the greatest was between Personal Integration (PI) and I-E for both sexes. PI is a measure of self concept expressed primarily in terms of the extent to which the individual feels either that he is alienated and inadequate (low scorers), or that there are no barriers or problems in understanding between himself and others (high scorers). This finding tends to support the prediction of a low linear correlation between I-E and adjustment.

Insert Table 4 about here

In the stepwise multiple regression analysis, three OPI scales made significant increases in the multiple correlation for each sex, but apart from the first they were not the same (Table 5). For the males PI and MF (both negatively correlated with I-E) and RO (positively correlated with I-E) were the significant scales. However, comparison of the beta^2 for each scale,

which is a measure of the ratio of the independent contribution of each scale to the multiple R (McNemar, 1969), indicates that the contribution of PI is at least six times that of either of the other two scales. For the females PI and TO (both negatively correlated to I-E) and Au (positively correlated to I-E) were also quite different in their independent contributions to the multiple R. PI was twice as large as the other two combined (compared with four times as large for males). Au was almost half as large as PI. Therefore, although there were three significant predictors for each sex, the regression equation for males seems to be characterized primarily by PI, while for females it is a combination of PI and Au.

Insert Table 5 about here

Second Analysis

In the second analysis, the factor structures of the normative groups also were found to be almost identical (Table 6). However, there were considerable differences between sexes in

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Insert Table 6 about here

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the zero order correlations between OPI factors and I-E score (Table 7). Although Factor II, Good Adjustment & Positive Self-Regard, and Factor V, Impulsivity, were significantly correlated to I-E for both sexes, the remaining factors which were significantly correlated to I-E were not the same.

Insert Table 7 about here

In the stepwise multiple regression analysis, five factors made significant increases in the multiple R for both sexes, and three of them were different for each sex (Table 8). One of the two shared factors, Factor V, entered at the fourth step for males and the second step for females. However, examination of the beta^2 column indicated that the independent contribution of Factor V to the multiple R was in approximately the same ratio to the other factors for both sexes. In both cases, Factor II made the largest contribution to the multiple R and, especially with the females, there was very little difference in the ratio of the independent contributions of the other significant factors.

Insert Table 8 about here

The attempt to predict male I-E scores by combining the three factors which were significant predictors for females with the two factors which were significant predictors for both sexes was not successful. Only one of the three (Factor IV) made a significant increase in the multiple R (Table 9), and it appears to be a suppresser in this case. It can be noted from Table 7 that the correlation of Factor IV with I-E is almost zero ($r = -.09$), but its correlations with Factors II and V, the two variables initially in the equation, are -.14 and .16 respectively. Also, its beta weight is negative (-.17). This evidence supports the probability that Factor V is a suppresser in this instance.

In the parallel analysis with females, none of the three forced variables made a significant increase in the multiple R (Table 9).

Insert Table 9 about here

DISCUSSION

These results indicate that although there is considerable independence of the two instruments, a significant portion of the variance in the I-E scale (approximately 25%) is shared by scales, or factors, or the OPI. Furthermore, this correlation supports the theoretical expectation of a positive relationship between internal locus of control and personal adjustment. Based on the interpretive material in the OPI Manual (Heist & Yonge, 1968), and the correlations reported above, both males and females who are internal tend to be well-adjusted in the sense of a positive attitude toward themselves. They tend not to have, or not admit to having, psychological difficulties and anxieties, and they tend not to have a need to pursue deviant, or unconventional activities. This finding also lends support to recent inquiry into the antecedents of locus of control. Most of the studies on this topic reviewed by Lefcourt (1972) indicated that internality tends to be related to parental behaviors which contribute to good adjustment. In these studies, internal children tended to report nurturant parents and consistency in parental standards of behavior more often than did external children. In more recent studies, Hilaael (1972) found firm control, which would imply

consistency, to be correlated with internality and lax control to be correlated with externality for both upper and lower class children. Samson (1972) found in interviews with in-patients in a large state psychiatric hospital that unstable family relationships characterized by fighting, conflict, and tension tends to result in greater externality among the children. Johnson (1973) found a relationship between externality and over-protectiveness and restrictiveness in the child-rearing attitudes of the mother. Finally, Palmer (1972) found fearfulness in children to be significantly related to externality. Since the Ss in the above studies were children, the present results extend the relationship between adjustment and locus of control to college freshmen. It would be desirable to have a longitudinal study designed to relate the above relationships between locus of control and parental behaviors to the measures of adjustment taken by the I-E scale and the OPI.

The present findings also indicate that there are differences in the personality profiles of male and female college freshmen in relation to locus of control. As indicated by an interpretation of the results summarized in Table 8, internally oriented females tend to be more intellectual and competitive, and prefer certainty to ambiguity. Males who are internally oriented tend to be more affiliative and conservative, both socially and religiously. As pointed out above, there is little basis in the previous research on locus of control to anticipate such a finding. However, these results seem reasonable considering the sex differences in role expectations in our society, and the consequent differences in

reinforcement contingencies. Hence, it would not be surprising that apart from their similarities in terms of good adjustment, internal female college freshmen would tend to have a personality profile which is characteristically different from that of their male counterparts. In conclusion, we feel that further investigation into the similarities and differences of male and female personality profiles in relation to locus of control are warranted by these results. Furthermore, it would seem desirable in the study of either the antecedents of locus of control, or the development of locus of control expectancies, to identify the influences that are operating independently on males and females, in addition to the influences which are affecting them jointly.

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TABLE 1

Comparison of I-E Scores for Males and Females

Sex	N	$\bar{X}$[a]	SD	alpha
Males	140	10.39	4.4858	.77
Females	130	11.49	4.7333	.81

[a] The means are significantly ($p < .05$) different ($t = 1.9655$).

TABLE 2

Comparison of OPI Scale Scores for Males and Females

OPI Scales	$\bar{X}$		SD		t
	Male	Female	Male	Female	
Thinking Introversion	26.18	27.26	7.33	7.12	1.2163
Theoretical Orientation	20.69	17.67	5.37	5.26	4.6479*
Estheticism	12.56	15.64	5.35	4.24	5.2051*
Complexity	17.67	18.15	5.98	5.98	.8881
Autonomy	28.85	30.25	6.34	6.13	1.8323
Religious Orientation	14.30	13.99	5.69	5.11	.4541
Social Extroversion	20.99	20.97	7.18	7.25	.0385
Impulse Expression	30.76	28.88	9.73	8.43	1.6858
Personal Integration	29.63	28.64	10.35	9.81	.8024
Anxiety Level	12.30	11.28	4.68	4.51	1.8068
Altruism	20.03	23.41	5.78	5.25	4.9987*
Practical Outlook	12.02	9.92	5.28	5.12	3.3113*
Masculinity-Femininity	29.52	21.12	6.11	4.77	11.2427*
Response Bias	13.16	11.30	4.20	3.97	3.7286*

*P(2 tail) < .05

TABLE 3

Comparison of Male and Female Factor Structures on the OPI Based on Sample Data

Cosines of:	Median	Range
Matched Factors	1.00	.99-1.00
Unmatched Factors	.01	.00- .07

TABLE 4

Zero Order Correlations of OPI Scale Scores With I-E Scores

OPI	I-E	
	Male	Female
Thinking Introversion	.06	-.08
Theoretical Orientation	-.06	-.16
Estheticism	.24*	.11
Complexity	.21*	.23*
Autonomy	.13	.23*
Religious Orientation	.27*	.20*
Social Extroversion	-.10	-.16
Impulse Expression	.29*	.28*
Personal Integration	-.43*	-.46*
Anxiety Level	-.27*	-.31*
Altruism	-.25*	-.24*
Practical Outlook	-.10	-.08
Masculinity-Femininity	-.26*	-.18*
Response Bias	-.31	-.31

*P(2 tail) < .05

TABLE 5

Multiple Correlations of OPI Scales With I-E Score, by Sex

OPI Scales[a]	Beta[2]	Multiple R	F to Enter
MALES			
Personal Integration	.18	.43	30.46*
Religious Orientation	.03	.46	5.03*
Masculinity-Femininity	.02	.48	3.45*
FEMALES			
Personal Integration	.21	.46	33.71*
Autonomy	.08	.54	14.05*
Theoretical Orientation	.03	.56	4.43*

[a]Only those scales which made a significant increase ($p < .05$) in the multiple R are included.

*$P < .05$

TABLE 6

Comparison of Male and Female Factor Structures on the OPI Based on Normative Data

Cosines of:	Median	Range
Matched Factors	.98	.95-1.00
Unmatched Factors	.03	.00- .18

TABLE 7

Zero Order Correlations of OPI Factor Scores With I-E Scores

OPI Factor	I-E	
	Male	Female
I. Anti-Intellectual Authoritarianism	-.04	-.10
II. Good Adjustment & Positive Self-Regard	-.25*	-.27*
III. Esthetic & Feminine Interests	.22*	.01
IV. Theoretical & Philosophical Orientation	-.09	-.19*
V. Impulsivity	.18*	.21*
VI. Social Introversion	.04	.15
VII. Altruism	-.18*	-.08
VIII. Religious Liberalism	.20*	.11
IX. Tolerance for Ambiguity	.16	.20*

P(2 tail) < .05

TABLE 8

Multiple Correlation of OPI Factors With I-E Scale, by Sex

OPI Factors[a]	Beta[2]	Multiple R	F to Enter
Males			
II. Good Adjustment & Positive Self-Regard	.06	.25	9.17*
III. Esthetic & Feminine Interests	.05	.34	8.48*
VII. Altruism	.04	.40	7.12*
V. Impulsivity	.04	.45	7.63*
VIII. Religious Liberalism	.03	.48	5.01*
Females			
II. Good Adjustment & Positive Self-Regard	.07	.27	10.27*
V. Impulsivity	.05	.35	7.10*
IV. Theoretical & Philosophical Orientation	.05	.42	7.46*
IX. Tolerance for Ambiguity	.04	.46	6.73*
VI. Social Introversion	.04	.50	6.02*

[a]Only those factors which made a significant increase ($p < .05$) in the multiple R are included.
*$P < .05$.

TABLE 9

Multiple Correlation of OPI Factors With I-E Scale Using Significant Predictors for Opposite Sex

OPI Factors	Beta^2	Multiple R	F to Enter
Males			
II. Good Adjustment & Positive Self-Regard	.06	.25	9.17*
V. Impulsivity	.03	.31	4.80*
IV. Theoretical & Philosophical Orientation	.03	.35	4.07*
IX. Tolerance for Ambiguity	.01	.36	1.94
VI. Social Introversion	.01	.37	.81
Females			
II. Good Adjustment & Positive Self-Regard	.07	.27	10.27*
V. Impulsivity	.05	.35	7.10*
VII. Altruism	.02	.38	2.93
VIII. Religious Liberalism	.01	.39	1.17
III. Esthetic & Feminine Interests	.00	.39	.13

*P < .05